

## Claims

1           1.    A method for re-mapping packet identifier (PID)  
2    values provided in transport packets associated with  
3    multiple transport streams to be multiplexed onto a single  
4    shared transport channel, said method comprising:

5                    providing at least one PID re-map table having re-  
6    map values indexed by n possible PID values of  
7    transport packets associated with at least one  
8    transport stream of the multiple transport streams,  
9    wherein n is less than all possible PID values of  
10   transport packets within said multiple transport  
11   streams; and

12                   comparing PID values of transport packets  
13   associated with said at least one transport stream with  
14   said n possible PID values of said at least one PID re-  
15   map table, and when a match is found, indexing said at  
16   least one PID re-map table using said matching PID  
17   value, generating therefrom a re-map value, and  
18   replacing said matching PID value by said re-map value.

1           2.    The method of claim 1, further comprising when a  
2    non-matching PID value is found, replacing said non-matching  
3    PID value with a null value, meaning that the associated  
4    transport packet is to be discarded.

1           3.    The method of claim 1, wherein said single shared  
2   transport channel couples to a transport demultiplexor, and  
3   wherein said transport demultiplexor can handle x PID  
4   values, and  $n \leq x$ .

1           4.    The method of claim 3, wherein said n possible PID  
2   values equals 32 possible PID values.

1           5.    The method of claim 1, further comprising  
2   receiving said multiple transport streams from multiple  
3   network interfaces, each network interface being coupled to  
4   receive a separate network input.

1           6.    The method of claim 5, further comprising  
2   interleaving said multiple transport streams on a packet  
3   basis for output onto said single shared transport channel.

1           7.    The method of claim 6, further comprising  
2   buffering selected transport packets of said multiple  
3   transport streams prior to interleaving thereof to ensure  
4   each packet is complete before interleaving.

1           8.    The method of claim 1, wherein said multiple  
2   transport streams comprise two transport streams, and  
3   wherein said method comprises providing a separate PID re-  
4   map table for each of said two transport streams, and  
5   comparing PID values of transport packets associated with  
6   each of said two transport streams with entries of said  
7   respective PID re-map tables.

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1           9.    The method of claim 8, further comprising  
2    receiving said two transport streams for re-mapping, wherein  
3    each transport stream contains a real time clock reference.

1           10.   The method of claim 1, wherein said multiple  
2    transport streams include navigation tables indicative of  
3    the PID values in use by the respective transport streams,  
4    and wherein said method further comprises monitoring said  
5    navigation tables and adjusting said n possible PID values  
6    of transport packets responsive to changes in said  
7    navigation tables.

1           11.   The method of claim 1, further comprising  
2    receiving said multiple transport streams and synchronizing  
3    each stream to identify packet boundaries.

1           12.   The method of claim 11, wherein said receiving  
2    comprises receiving at least one transport stream of the  
3    multiple transport streams through a network interface, said  
4    at least one transport stream comprising a live network  
5    input.

1           13.   The method of claim 12, wherein at least one  
2    transport stream of said multiple transport streams  
3    comprises a transport stream retrieved from a storage device  
4    associated with a transport demultiplexor coupled to receive  
5    said interleaved transport packets.

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1           14. The method of claim 1, further in combination with  
2 performing clock recovery on the at least one transport  
3 stream, and wherein said re-mapping method comprises when a  
4 non-matching PID value is found, discarding the transport  
5 packet associated with the said non-matching PID value.

1           15. A method for processing transport packets  
2 associated with multiple transport streams, said method  
3 comprising:

4           re-mapping packet identifier (PID) values provided  
5 in transport packets associated with at least one  
6 transport stream of the multiple transport streams,  
7 said re-mapping comprising:

8           providing at least one PID re-map table  
9 having re-map values indexed by n possible PID  
10 values of transport packets associated with at  
11 least one transport stream of the multiple  
12 transport streams, wherein n is less than all  
13 possible PID values of transport packets within  
14 said multiple transport streams;

15           comparing PID values of transport packets  
16 associated with said at least one transport stream  
17 with said n possible PID values of said at least  
18 one PID re-map table, and when a match is found,  
19 indexing said at least one PID re-map table using  
20 said matching PID value, generating therefrom a  
21 re-map value, and replacing said matching PID  
22 value by said re-map value.

23           interleaving selected transport packets of said  
24 multiple transport streams;

25 forwarding said interleaved transport packets of  
26 said multiple transport streams to a single transport  
27 demultiplexor; and

28 demultiplexing said interleaved transport packets  
29 of said multiple transport streams employing said  
30 single transport demultiplexor.

1 16. The method of claim 15, wherein said interleaving  
2 comprises interleaving said multiple transport streams on a  
3 packet basis for output to said single transport  
4 demultiplexor.

1 17. The method of claim 16, further comprising  
2 buffering said selected transport packets prior to  
3 interleaving thereof to ensure each packet is complete  
4 before interleaving.

1 18. The method of claim 15, further comprising  
2 receiving said multiple transport streams and synchronizing  
3 each stream to identify packet boundaries.

1 19. The method of claim 18, wherein said receiving  
2 comprises receiving said multiple transport streams for  
3 multiple network interfaces, each network interface being  
4 coupled to receive a separate live network input.

1           20. The method of claim 18, wherein said receiving  
2 comprises receiving at least one transport stream of  
3 multiple transport streams through a network interface, said  
4 at least one transport stream comprising a live network  
5 input.

1           21. The method of claim 20, wherein at least one  
2 transport stream of said multiple transport streams  
3 comprises a transport stream retrieved from a storage device  
4 associated with said single transport demultiplexor.

1           22. The method of claim 15, wherein said method is  
2 implemented within a set-top-box system.

1           23. The method of claim 15, further comprising when a  
2 non-matching PID value is found, replacing said non-matching  
3 PID value with a null value, meaning that the associated  
4 transport packet is to be discarded.

1           24. The method of claim 15, wherein said transport  
2 demultiplexor can handle x PID values, and  $n \leq x$ .

1           25. The method of claim 15, wherein said multiple  
2 transport streams include navigation tables indicative of  
3 the PID values in use by the respective transport streams,  
4 and wherein said method further comprises monitoring said  
5 navigation tables and adjusting said n possible PID values  
6 of transport packets responsive to changes in said  
7 navigation tables.

1           26. A system of re-mapping packet identifier (PID)  
2 values provided in transport packets associated with  
3 multiple transport streams to be multiplexed onto a single  
4 shared transport channel, said system comprising:

5           means for providing at least one PID re-map table  
6 having re-map values indexed by n possible PID values  
7 of transport packets associated with at least one  
8 transport stream of the multiple transport streams,  
9 wherein n is less than all possible PID values of  
10 transport packets within said multiple transport  
11 streams; and

12           means for comparing PID values of transport  
13 packets associated with said at least one transport  
14 stream with said n possible PID values of said at least  
15 one PID re-map table, and when a match is found, for  
16 indexing said at least one PID re-map table using said  
17 matching PID value, generating therefrom a re-map  
18 value, and replacing said matching PID value by said  
19 re-map value.

1           27. The system of claim 26, further comprising when a  
2 non-matching PID value is found, means for replacing said  
3 non-matching PID value with a null value, meaning that the  
4 associated transport packet is to be discarded.



1           28. The system of claim 26, wherein said single shared  
2 transport channel couples to a transport demultiplexor, and  
3 wherein said transport demultiplexor can handle x PID  
4 values, and  $n \leq x$ .

1           29. The system of claim 28, wherein said n possible  
2 PID values equals 32 possible PID values.

1           30. The system of claim 26, further comprising means  
2 for receiving said multiple transport streams from multiple  
3 network interfaces, each network interface being coupled to  
4 receive a separate network input.

1           31. The system of claim 30, further comprising means  
2 for interleaving said multiple transport streams on a packet  
3 basis for output onto said single shared transport channel.

1           32. The system of claim 31, further comprising means  
2 for buffering selected transport packets of said multiple  
3 transport streams prior to interleaving thereof to ensure  
4 each packet is complete before interleaving.

1           33. The system of claim 26, wherein said multiple  
2 transport streams comprise two transport streams, and  
3 wherein said system comprises means for providing a separate  
4 PID re-map table for each of said two transport streams, and  
5 for comparing PID values of transport packets associated  
6 with each of said two transport streams with entries of said  
7 respective PID re-map tables.



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1           39. The system of claim 26, further comprising means  
2   for performing clock recovery on the at least one transport  
3   stream, and when a non-matching PID value is found, means  
4   for discarding the transport packet associated with the non-  
5   matching PID value.

1           40. A system for processing transport packets  
2 associated with multiple transport streams, said system  
3 comprising:

4           means for re-mapping packet identifier (PID)  
5 values provided in transport packets associated with at  
6 least one transport stream of the multiple transport  
7 streams, said means for re-mapping comprising:

8           means for providing at least one PID re-map  
9 table having re-map values indexed by n possible  
10 PID values of transport packets associated with at  
11 least one transport stream of the multiple  
12 transport streams, wherein n is less than all  
13 possible PID values of transport packets within  
14 said multiple transport streams;

15           means for comparing PID values of transport  
16 packets associated with said at least one  
17 transport stream with said n possible PID values  
18 of said at least one PID re-map table, and when a  
19 match is found, for indexing said at least one PID  
20 re-map table using said matching PID value,  
21 generating therefrom a re-map value, and replacing  
22 said matching PID value by said re-map value;

23           means for interleaving selected transport packets  
24 of said multiple transport streams;

25 means for forwarding said interleaved transport  
26 packets of said multiple transport streams to a single  
27 transport demultiplexor; and

28 wherein said transport demultiplexor comprises  
29 means for demultiplexing said interleaved transport  
30 packets of said multiple transport streams.

1 41. The system of claim 40, wherein said means for  
2 interleaving comprises means for interleaving said multiple  
3 transport streams on a packet basis for output to said  
4 single transport demultiplexor.

1 42. The system of claim 41, further comprising means  
2 for buffering said selected transport packets prior to  
3 interleaving thereof to ensure each packet is complete  
4 before interleaving.

1 43. The system of claim 40, further comprising means  
2 for receiving said multiple transport streams and  
3 synchronizing each stream to identify packet boundaries.

1 44. The system of claim 43, wherein said means for  
2 receiving comprises means for receiving said multiple  
3 transport streams for multiple network interfaces, each  
4 network interface being coupled to receive a separate live  
5 network input.

1           45. The system of claim 43, wherein said means for  
2 receiving comprises means for receiving at least one  
3 transport stream of multiple transport streams through a  
4 network interface, said at least one transport stream  
5 comprising a live network input.

1           46. The system of claim 45, wherein at least one  
2 transport stream of said multiple transport streams  
3 comprises a transport stream retrieved from a storage device  
4 associated with said single transport demultiplexor.

1           47. The system of claim 40, wherein said system is  
2 implemented within a set-top-box system.

1           48. The system of claim 40, further comprising when a  
2 non-matching PID value is found, means for replacing said  
3 non-matching PID value with a null value, meaning that the  
4 associated transport packet is to be discarded.

1           49. The system of claim 40, wherein said transport  
2 demultiplexor can handle x PID values, and  $n \leq x$ .

1           50. The system of claim 40, wherein said multiple  
2 transport streams include navigation tables indicative of  
3 the PID values in use by the respective transport streams,  
4 and wherein said system further comprises means for  
5 monitoring said navigation tables and adjusting said n  
6 possible PID values of transport packets responsive to  
7 changes in said navigation tables.

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1           51. A system for processing transport packets  
2 associated with multiple transport streams to be multiplexed  
3 into a single transport demultiplexor, said system  
4 comprising:

5           at least one PID re-map table having re-map values  
6 indexed by n possible PID values of transport packets  
7 associated with at least one transport stream of the  
8 multiple transport streams, wherein n is less than all  
9 possible PID values of transport packets within the  
10 multiple transport streams; and

11           a controller that compares PID values of transport  
12 packets associated with said at least one transport  
13 stream with said n possible PID values of said at least  
14 one PID re-map table, and when a match is found,  
15 indexes said at least one PID re-map table using said  
16 matching PID value, generates therefrom a re-map value,  
17 and replaces said matching PID value by said re-map  
18 value.

1           52. A system for processing transport packets  
2 associated with multiple transport streams, said system  
3 comprising:

4           re-mapping logic that re-maps packet identifier  
5 (PID) values provided in transport packets associated  
6 with at least one transport stream of the multiple  
7 transport streams, said re-mapping logic comprising:

8           at least one PID re-map table having re-map  
9 values indexed by n possible PID values of  
10 transport packets associated with at least one  
11 transport stream of the multiple transport  
12 streams, wherein n is less than all possible PID  
13 values of transport packets within the multiple  
14 transport streams;

15           a controller that compares PID values of  
16 transport packets associated with said at least  
17 one transport stream with said n possible PID  
18 values of said at least one PID re-map table, and  
19 when a match is found, indexes said at least one  
20 PID re-map table using said matching PID value,  
21 generates therefrom a re-map value, and replaces  
22 said matching PID value by said re-map value;

23           a multiplexor for interleaving selected transport  
24 packets of said multiple transport streams; and





1           53. A least one program storage device readable by a  
2 machine, tangibly embodying at least one program of  
3 instructions executable by the machine to perform a method  
4 for re-mapping packet identifier (PID) values provided in  
5 transport packets associated with multiple transport streams  
6 to be multiplexed onto a single shared transport channel,  
7 said method comprising:

8           providing at least one PID re-map table having  
9 re-map values indexed by n possible PID values of  
10 transport packets associated with at least one  
11 transport stream of the multiple transport streams,  
12 wherein n is less than all possible PID values of  
13 transport packets within said multiple transport  
14 streams; and

15           comparing PID values of transport packets  
16 associated with said at least one transport stream with  
17 said n possible PID values of said at least one PID re-  
18 map table, and when a match is found, indexing said at  
19 least one PID re-map table using said matching PID  
20 value, generating therefrom a re-map value, and  
21 replacing said matching PID value by said re-map value.

1           54. The at least one program storage device of claim  
2           53, further comprising when a non-matching PID value is  
3           found, replacing said non-matching PID value with a null  
4           value, meaning that the associated transport packet is to be  
5           discarded.

1           55. The at least one program storage device of claim  
2           53, wherein said single shared transport channel couples to  
3           a transport demultiplexor, and wherein said transport  
4           demultiplexor can handle x PID values, and  $n \leq x$ .

1           56. The at least one program storage device of claim  
2           55, wherein said n possible PID values equals 32 possible  
3           PID values.

1           57. The at least one program storage device of claim  
2           53, further comprising receiving said multiple transport  
3           streams from multiple network interfaces, each network  
4           interface being coupled to receive a separate network input.

1           58. The at least one program storage device of claim  
2           57, further comprising interleaving said multiple transport  
3           streams on a packet basis for output onto said single shared  
4           transport channel.

1           59. The at least one program storage device of claim  
2           58, further comprising buffering selected transport packets  
3           of said multiple transport streams prior to interleaving  
4           thereof to ensure each packet is complete before  
5           interleaving.







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1           67. At least one program storage device readable by a  
2 machine tangibly embodying at least one program of  
3 instructions executable by the machine to perform a method  
4 of processing transport packets associated with multiple  
5 transport streams, said method comprising:

6           re-mapping packet identifier (PID) values provided  
7 in transport packets associated with at least one  
8 transport stream of the multiple transport streams,  
9 said re-mapping comprising:

10           providing at least one PID re-map table  
11 having re-map values indexed by n possible PID  
12 values of transport packets associated with at  
13 least one transport stream of the multiple  
14 transport streams, wherein n is less than all  
15 possible PID values of transport packets within  
16 said multiple transport streams;

17           comparing PID values of transport packets  
18 associated with said at least one transport stream  
19 with said n possible PID values of said at least  
20 one PID re-map table, and when a match is found,  
21 indexing said at least one PID re-map table using  
22 said matching PID value, generating therefrom a  
23 re-map value, and replacing said matching PID  
24 value by said re-map value.

25           interleaving selected transport packets of said  
26 multiple transport streams;

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27 forwarding said interleaved transport packets of  
28 said multiple transport streams to a single transport  
29 demultiplexor; and

30 demultiplexing said interleaved transport packets  
31 of said multiple transport streams employing said  
32 single transport demultiplexor.

1 68. The at least one program storage device of claim  
2 67, wherein said interleaving comprises interleaving said  
3 multiple transport streams on a packet basis for output to  
4 said single transport demultiplexor.

1 69. The at least one program storage device of claim  
2 68, further comprising buffering said selected transport  
3 packets prior to interleaving thereof to ensure each packet  
4 is complete before interleaving.

1 70. The at least one program storage device of claim  
2 67, further comprising receiving said multiple transport  
3 streams and synchronizing each stream to identify packet  
4 boundaries.

1 71. The at least one program storage device of claim  
2 70, wherein said receiving comprises receiving said multiple  
3 transport streams for multiple network interfaces, each  
4 network interface being coupled to receive a separate live  
5 network input.





